

## **Existence of solutions for electron balance problem in the stationary radio-frequency induction discharges**

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### **Abstract**

© Published under licence by IOP Publishing Ltd. A sufficient condition for the existence of a minimal eigenvalue corresponding to a positive eigenfunction of an eigenvalue problem with nonlinear dependence on the parameter for a second order ordinary differential equation is established. The initial problem is approximated by the finite element method. Error estimates for the approximate minimal eigenvalue and corresponding positive eigenfunction are derived. Problems of this form arise in modelling the plasma of a radio-frequency discharge at reduced pressure.

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